

REMARKS

Claims 1 to 41 are pending for examination. Claims 1, 2, 4, 6, 9-24, 26-28, 30, 32, 39 and 40 are objected to because of the informalities noted by the Examiner. Claims 1-4 are rejected under 35 USC 102(b) as being anticipated by Hunt, US 4,335,427. Claims 1-4 are rejected under 35 USC 102(b) as being anticipated by Brown, US 5,459,769. Claims 9, 21, 25-28, 30 and 32-40 are rejected under 35 USC 103(a) as being unpatentable over Hunt, US 4,335,427 in view of Sharma, US 5,596,200. Claims 29 and 31 are rejected under 35 USC 103(a) as being unpatentable over Hunt, US 4,335,427 in view of Mistretta et al., US 3,854,049. Claims 5-8, 10-20 and 22-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to include all the limitations of the base claim and any intervening claims and overcoming the claim objections. Claim 41 is allowed.

Paragraph [0018] is amended to correct typographical and grammar errors.

In regard to the informality objections:

In claim 1, the proposed term "penetrate" does not adequately describe the operative characteristics of the energy beam with respect to the object to be examined. "Penetrate" *per se* does not result in a sensitive reception of the beam after "penetrating" the object to be examined. The term used by the applicant, --has crossed--, will result in a sensitive reception of the energy and would be understood by those skilled in the art.

Claim 2 is canceled; however, the subject matter of claim 2 is also recited in amended claim 1. It is settled patent claim interpretation that the exact order of the steps of a method is not defined by the order as recited in the claim. The subject of cancelled claim 2 recites that *a* first image is taken *before* injection (emphasis added). This recitation is not inconsistent with the text of amended claim 1.

Claim 4 is canceled; however, the subject matter of claim 4 is also recited in amended claim 1. Reference is made to the observations made regarding claim 2. Still further, the phrase "plurality of images" in amended claim 1 can be before or after or both with respect to the time when the contrast medium is injected.

Claim 6 is canceled; however, the subject matter of claim 6 is also recited in amended claim 1. Reference is made to the observations made regarding claims 2 and 4 that are equally applicable to the objection to claim 6.

In regard to claims 9-13, claims 9, 11, and 12 are canceled and claims 10 and 13 have been amended to overcome the objection. In particular, claims 10 and 13 are each dependent on amended claim 1. Amended claim 1 recites "at least one" which does not infer only one but may be more than one. Claims 10 and 13 recite "images" which does not infer one but more than one.

In regard to claims 13-17, line 3, claims 15 and 16 are canceled. Claims 13 and 14 have been amended as proposed.

In regard to claims 18-20, the claims have been amended as proposed.

In regard to claim 19, reference is made to the observations regarding claim 1 and claims 9-13 which are equally applicable to the objection to claim 19.

In regard to claims 21-24, reference is made to the observations regarding claim 1 and claim 4 and claims 9-13 which are equally applicable to the objection to claims 21-24.

In regard to claims 26-28, the dependency of the claims has been amended to overcome the objection.

In regard to claim 30, the typographical error has been corrected to overcome the objection.

In regard to claims 32 and 34, the applicant and the claims do not imply that "gray level" is only applicable to the "second image." A gray scale level is applicable and operatively appropriate for any image.

Claims 39 and 40 are canceled. The subject matter of claims 39 and 40 is presented in new claims 70-93.

Independent claim 1 is amended to recite the subject matter of claims 5-8, noting that cancelled claims 5-8 were considered allowable. Independent claim 35 is also amended to recite the subject matter of cancelled claims 5-8. Claims 1, 35 and 41 are amended to ensure that the scope and extent of protection is not limited to digital created images or X-rays. Claims 1, 35 and 41, as amended, are now considered allowable.

Claims dependent on either claim 1 or claim 35 are considered allowable, noting that claims 10-20 and 22-24 were considered allowable. Claims 29, 31, 37, and 38 remain as presented without amendment. New claims 42 to 69 are each dependent on either claim 1 or claim 35 and are considered allowable.

New claims 70 to 93 are presented to recite further protection for the disclosed invention in the several formats, manners or ways it can be implemented or practiced. Independent claims 70, 81, 92 and 93 each recited the subject matter of allowable claims 1 and 35. Claims dependent on claim 70 or 81 or 92 or 93 are considered allowable.

In view of the amendment presented herewith, claims 1, 10, 13, 14, 17-38 and 41 - 93 is pending and is considered allowable and Notice thereof is requested.

In regard to the reason for allowance, the applicant notes the following. Claims 5-8, 10-12, 14-16, 18-20 and 22-24 are considered as reciting allowable subject matter but no longer require a limitation to X-rays as recited by the Examiner. Claims 13 and 17 are considered as reciting allowable subject matter but the phrase "wherein after an image is taken at shorter intervals" is not understood and is not recited in the claims. Claim 41 is considered allowable but the claim recites "during or after or *at the end*" (emphasis added)

Respectfully submitted.

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Claims 1, 10, 13, 14, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 30, 32, 33, 34, 35, 36 and 41 as amended to show the amendment.

1. A method for radiological examination of an organ comprising the steps of:

- (a) injecting a contrast medium into the organ to be examined;
- (b) emitting an [X-ray] energy beam in the direction of the organ;
- (c) taking a plurality of [digital] images after the [X-ray] energy beam has crossed the organ; wherein a first image is taken before injection of the contrast medium and at least one second image is taken after injection of the contrast medium during a phase of heightened attenuation due to the contrast medium; and
- (d) calculating a representative image of the contrast produced in the tissues of the organ from the [digital] images.

10. The method according to claim [5] 1 in which the at least one second images are taken at intervals equally distributed in time.

13. The method according to claim [3] 1 in which the at least one second images are taken at shorter intervals of time during the phase of heightened attenuation due to the contrast medium than after the phase of heightened attenuation.

14. The method according to claim [5] 10 in which the at least one second images are taken at shorter intervals of time during the phase of heightened attenuation due to the contrast medium than after the phase of heightened attenuation.

17. The method according claim [3] 1 in which [a] at least one second image is taken at the end of the attenuation phase and a third image is taken a few minutes after the end of the attenuation phase.

18. The method according claim [5] 10 in which a second image is taken at the end of the attenuation phase and a third image is taken a few minutes after the end of the attenuation phase.

19. The method according claim [6] 13 in which [a] at least one second image is taken at the end of the attenuation phase and a third image is taken a few minutes after the end of the attenuation phase.

20. The method according claim [7] 14 in which [a] at least one second image is taken at the end of the attenuation phase and a third image is taken a few minutes after the end of the attenuation phase.

21. The method according to claim [3] 1 in which the first image is subtracted from each of the at least one second images

22. The method according to claim [5] 10 in which the first image is subtracted from each of the at least one second images.

23. The method according to claim [6] 13 in which the first image is subtracted from each of the second images.

24. The method according to claim [7] 14 in which the first image is subtracted from each of the at least one second images.

26. The method according to claim [27] 22 in which the subtracted images are filtered spatially.

27. The method according to claim [28] 23 in which the subtracted images are filtered spatially.

28. The method according to claim [29] 24 in which the subtracted images are filtered spatially

30. The method according to claim 1 wherein the examination is [mammorgraphy] mammography.

32. The method of claim [3] 1 wherein a gray level of the at least one second image is proportional to a quantity of the contrast medium per unit surface of the image.

33. The method according to claim [3] 1 wherein the number of at least one second images can range between 2 and 10.

34. The method according to claim [3] 1 wherein a gray level of the at least one second image depends on the density of contrast medium in the organ.

35. A radiology apparatus comprising:
means for injection of a contrast medium into an organ to be examined;
means for emitting an energy beam;
means for receiving the energy beam and capable of sending an output of [a digital] a first image taken before injection of the contrast medium representative of the incident energy beam and at least one second image taken after injection of the contrast medium during a phase of heightened attenuation due to the contrast medium representative of the incident energy beam; and
means for processing capable of controlling the means for emitting and processing data from the means for receiving in order to calculate a representative image of the contrast produced in the tissues of the organ from the [digital] images.

36. The apparatus according to claim 35 wherein the means for processing is capable of controlling the means for injection of a contrast medium after the acquisition of [a] the first image and before the acquisition of other images.

41. A method of radiological examination of an organ comprising the steps of:

- (a) emitting an energy [X-ray] beam in the direction of the organ to be examined;
- (b) taking a first image of the organ;
- (c) injecting a contrast medium into the organ;
- (d) taking at least one second image of the organ after the injection of the contrast medium, wherein the second image is taken during or after or at the end of the attenuation phase when the beam [X-rays] cross the organ;
- (e) subtracting the first image from the second image; and
- (f) calculating a curve of attenuation or a representative image of the contrast produced in the organ from the images.